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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,946	10/13/2005	Anna Louise Bouwkamp-Wijnoltz	NL030424US1	2508

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EXAMINER
EOFF, ANCA

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,946	BOUWKAMP-WIJNOLTZ ET AL.	
	Examiner	Art Unit	
	ANCA EOFF	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/13/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-11 are pending in the instant application.

2. The foreign priority document 03101028.3 filed with the European Patent Office on April 16, 2003 was received and acknowledged.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 introduces the limitation “underlying, preferably etchable layer” and claim 6 introduces the limitation "the ratio base solvent: tackifying solvent is 95:5 to 30:70 (w/w), more preferably 80:20 to 40:60 (w/w)" so it is not clear what subject matter is the applicant regarding as his invention.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraph of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Flosbach et al. (US Patent 6,268,021).

With regard to claims 1 and 4-6, Flosbach et al. disclose a composition comprising a polyester with carboxyl groups, which has an acid number of 210 to 300 mgKOH/g and one or more organic solvents (abstract).

Flosbach et al. disclose a solvent mixture comprising butyl glycol acetate (boiling point of 192°C), equivalent to the base solvent of the instant application and butyl diglycol acetate (246.8°C), equivalent to the tackifying solvent of the instant application.

The solvent mixture, the ration of butyl glycol acetate and butyl diglycol acetate is 50:50 (column 10, lines 41-43).

Since the use of the composition "for printing a patterned resist layer onto an underlying, preferably etchable layer" is an intended use of the composition, this limitation does not add any patentable weight to the claim. Therefore, it is the examiner's position that the composition of Flosbach et al. anticipates the composition of the instant application.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shepler (US Patent 6,107,403).

With regard to claims 1-2 and 4-5, Shepler disclose a composition comprising as a binder component at least one polyacrylate resin (column 2, lines 61-67).The polyacrylate resin comprises hydroxyl and/or carboxy groups and may have an acid number in the range from 40 to 140 mgKOH/g (column 4, lines 42-54).

The coating composition contains one or more organic solvents (column 13, lines 46-47). Examples of suitable solvents include butyl glycol acetate (boiling point of 192°C), equivalent to the base solvent of the instant application and ethyl diglycol acetate (boiling point 217.4°C), equivalent to the tackifying solvent of the instant application (column 13, lines 51-58).

While Shepler does not specifically disclose a composition comprising a mixture of butyl glycol acetate and ethyl diglycol acetate, it would have been obvious to one of ordinary skill in the art to obtain such mixture based on Shepler's teachings that one or more solvents may be used in the composition.

Since the use of the composition "for printing a patterned resist layer onto an underlying, preferably etchable layer" is an intended use of the composition, this limitation does not add any patentable weight to the claim. Therefore, it is the examiner's position that the composition of Shepler renders obvious the composition of the instant application.

With regard to claim 3, Shepler discloses that the polyacrylate resin has a number average molecular weight preferably between 1,000 and 5,000 and a ratio of

weight average molecular weight Mw to the number average molecular weight Mn preferably between 1.8 and 4.0 (column 4, line 57-59 and column 6, lines 51-55). This translates into molecular weights of the polyacrylate resin between 1,800 and 20,000 gr / mol.

With regard to claim 6, Shepler discloses a solvent mixture wherein butyl glycol acetate is comprised in a ratio of 50:50 with another solvent (column 17, lines 15-27).Therefore, it would have been obvious to one of ordinary skill in the art to obtain a mixture of butyl glycol acetate and ethyl diglycol acetate wherein the ratio of butyl glycol acetate and ethyl diglycol acetate is 50:50 based on the teaching that these two solvents may be used in combination and on the specific example in column 17, lines 15-27.

With regard to claim 7, Shepler does not disclose that the composition comprises sodium, potassium and/or halogen. Therefore, it is the examiner's position that the composition is free of such compounds and the limitation of claim 7 is met.

9. Claims 1-5 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (US Patent 6,221,933) in view of Kikuchi et al. (US Patent 5,268,255).

With regard to claims 1-5 , Zhu et al. disclose an ink composition comprising an acidic resin with an acid number of from about 10 to about 250 (abstract). Zhu et al. specifically disclose acrylic resins such as :

-SURCOL 441 with an acid number of about 100 and an average molecular weight of about 45,000;

-JONCRYL 587 having an acid number of 108, and

-JONCRYL 683 having an acid number of about 160 (column 8, lines 1-11).

Zhu et al. further disclose that the ink composition can comprise a humectant, which are hydrophilic solvents having high boiling points, preferably above 100°C and more preferably in the range of from 150 to about 250oC (column 9, lines 1-8).

However, Zhu et al. fail to disclose that the ink can comprise a solvent mixture of a solvent having a boiling point between 100 and 250°C and a solvent having a boiling point between 200 and 350°C, as required by the instant application.

Kikuchi et al. disclose a photo-setting resist composition which needs to have satisfactory coating properties in order to be used as ink. The resist composition is applied on one side of a printed circuit board by screen printing or with a roll coater to form a film with uniform thickness and no void (column 3, lines 40-46).

The resist composition of comprises high boiling solvents, such as methyl cellosolve, ethyl cellosolve, butyl cellosolve, acetates of these cellosolves, methyl carbitol, ethyl carbitol (column 9, lines 35-41).

Since these high- boiling solvents are successfully used in the resist composition of Kikuchi et al. which may be used as an ink, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the high-boiling solvents in the ink composition of Zhu.

The butyl cellosolve acetate is equivalent to butyl glycol acetate base solvent of the instant application and has a boiling point of 192.3°C.

Butyl carbitol has a boiling point of 230.4°C and it is equivalent to the tackifying solvent of the instant application.

10. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (US Patent 6,221,933) in view of Kikuchi et al. (US Patent 5,268,255) as applied to claim 1 above and in further view of Jeong et al. (US Pg-Pub 2003/0122896) and Sahbari et al. (US Patent 6,475,966).

With regard to claims 8-9, Jeong et al. disclose that display devices, such as liquid crystal display devices include an active device, such as a thin film transistor (TFT) in each pixel to drive the display device (par.0004).The fabrication of a TFT utilizes a pattern formed by gravure offset printing (par.0014), wherein in said gravure offset printing process ink is transferred to a substrate by using a transfer roll and a pattern is formed in a single step (par.0017).

The transfer roll contact the process-object layer (41) formed on the substrate (40) and the transfer roll is rotated. Then, the ink (24) is trasfered on the process-object layer (41). By applying heat to the transferred ink (24) and drying it, an ink pattern (42) is formed.

The process-object layer (41) is then etched by the ink pattern (42) to form a desired pattern (par.0025).

The process-object layer (41) is equivalent to the underlying etchable layer of the instant application and the ink pattern (42) is equivalent to the patterned resist layer of the instant application.

However, Jeong et al. fail to teach the constituents of the ink used in the gravure offset printing method.

Zhu modified by Kikuchi disclose the ink composition of claim 1 (see paragraph 9 of the Office Action). The ink is used for printing and it has good stability (column 3, lines 55-58).

Since the ink of Zhu modified by Kikuchi is used for printing and shows good stability, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the ink of Zhu modified by Kikuchi for the gravure offset printing process of Jeong et al.

Jeong, Zhu nor Kikuchi disclose a step of stripping the ink pattern (42) with an alkaline solvent, as required by the instant application.

Sahbari et al. disclose a method of manufacture of a component for an LCD (column 6, lines 23-31) wherein a metal stack constituted of copper, molybdenum, tungsten and titanium nitride has a photoresist pattern formed thereof. The metal stack is etched and the polymer residue is stripped with a stripper solution comprising tetramethylammonium hydroxide and hydroxylamine (see Example in column 6, lines 23-50).

The stripping of the polymer is important for the following reason: in order to succesfully integrate multiple film stacks into sub-micron features with the correct magnetic and signal sensitivity, each layer must be clean from polymer and other forms or organic/inorganic contamination or residue because such undesired residue will adversely affect the performance and reliability of the device (column 1, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a step of stripping the polymeric ink pattern of modified Jeong with a solution comprising tetramethylammonium hydroxide, as disclosed by Sahbari et al. in order to ensure the performance and reliability of the liquid crystal display of modified Jeong.

With regard to claims 10-11, Jeong et al. further disclose that the gravure offset printing process can be used to pattern various configurations and sub-assemblies of the display device, such as a metal pattern for a capacitor, a pixel electrode, the gate line and the data line connected to the TFT and the TFT, which are all structures necessary for a liquid crystal display device (par.0018).

Therefore, the process of modified Jeong meets the limitation of patterning of at least two layers selected from conductive, semi-conductive and insulating layers of the instant application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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